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The asexual cycle of *Plasmodium vivax* and *P. falciparum* were grown in vitro in human blood and in red blood cells in Locke's solution. There is evidence that the parasites cannot grow outside the red blood cells. Leucocytes devour the malarial plasmodia grown *in vitro* only when the parasites escape from red cells. By removing leucocytes, successive generations of both species may be had by adding fresh red cells and serum at proper intervals. The generation period varies greatly with temperature and probably with other conditions.

PURE CULTURES OF SPIROCHAETA IN VITRO

Noguchi (Jour. Exp. Med. Aug. 1912) describes the pure cultivation of several species of Spirochaeta and *Treponema pallida* in vitro. The conditions are: a temperature of about 37°C.; fresh sterile tissue, and a body fluid capable of forming a loose fibrin with the tissue; and some oxygen.

The germs do not lose wholly their pathogenic quality by such cultivation, tho the virulence seems diminished.

Both longitudinal and transverse division of these organisms is affirmed by the writer.

NOTES ON POLLEN

Lord Avebury gives (Jour. R. M. S., Oct. 1912) in popular form many facts relating to pollen,—its structure, development, variations in size, form and surface, colors, etc. He includes a table giving length of the pollen grain and length of pistil. He concludes that there is a distinct relation between these, especially convincing when nearly related species are compared. The article concludes with a summary of the family traits of the pollen of the various natural orders of plants.

ROOT NODULES IN PLANTS OTHER THAN THE LEGUMINOSÆ

Since the discovery that atmospheric nitrogen is assimilated by leguminous plants thru the action of symbiotic bacteria in the nodules of the roots, it has been an open question as to how widely this relationship and this power extend in the plant kingdom. In the investigation of this question it has been found that root nodules exist in Cyadaceæ, Elæaginaceæ, in *Alnus*, *Podocarpus*, and *Myrica*.

Spratt (Am. Bot., July 1912) reports studies of several genera of the Podocarpineæ and finds root nodules on all examined. These nodules are modified lateral roots. They are produced by the infection of the meristematic tissue of the young root, by *Pseudomonas radicola*, shown to be identical in cultures with the infesting bacterium in Leguminosæ. Cultures also show these organisms capable of assimilating atmospheric nitrogen.

A PLEA FOR THE FISH

"When removing an undersized trout from your hook, always moisten your hands before grasping the fish; otherwise the dry hand will remove the slime from the back of the trout, when it is only a question of time until fungus sets in and the fish will die.

Always kill your fish that are large enough to keep, as soon as taken from the hook. This can be done by giving it a stroke with a stick on the head, back of the eyes. It will avoid all suffering and make your fish far better for table use.

The American Fisheries Society at Washington, D. C., September 21-24, 1908, recommended that the various State Commissions educate the people by every means in their power to follow the directions given about wetting the hands.

Indorsed by twenty-eight Fish and Game Commissions throughout the United States."

G. H. THOMPSON, Fish Culturist,
Superintendent of the Estes Park Fish Hatchery.

HEREDITY IN RELATION TO EUGENICS

This book, by Dr. C. B. Davenport of the Carnegie Institution, is an effort to bring together, in a form that the intelligent worker even tho not a special student of biology may comprehend, some of the results derived from our modern studies of heredity, the methods whereby these results have been reached, and certain applications of these methods to the study of human traits and thru these to human guidance. The book ought to serve in a very real way the social worker, the physician, and the teacher of general biology. Dr. Davenport is one of the leading American students of this subject.

In Chapter I on "Eugenics: Its Nature, Importance and Aims", the writer defines the scope of this new hope that the quality of the